Protecting Cotton's Good Name

Lamesa is a rural community about 60 miles south of Lubbock and home to about 11,000 Texans. Its 1,200 cotton growers produce 200,000 bales annually, providing a stable economy for the local community.

But what happens if a town like Lamesa gets a reputation for weak and dirty cotton?

When that seemed to be the case in the 1960's, Lamesa growers, showing true Texas grit, decided to help themselves. They began by putting aside $40,000 to buy a new cotton testing system.

The system was developed by USDA's Agricultural Research Service in cooperation with Motion Control, Inc., a small instrument manufacturing company in Dallas. It was called High-Volume Instrumentation (HVI).

Growers heard that this system could classify cotton with amazing speed and accuracy. They reasoned it would prove they had quality cotton and enhance their market standing.

By the 1970's, when the Lamesa cotton classing office faced closure, growers raised nearly a million dollars more and obtained matching federal funds to keep it open. They were to be the first U.S growers to have a classing office that used the HVI system.

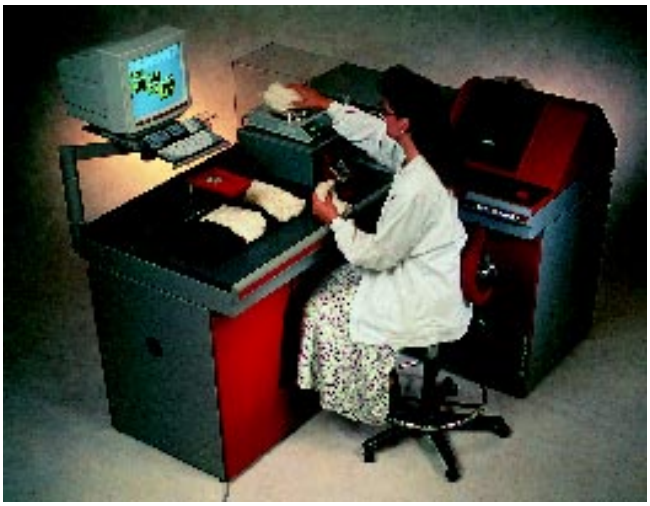
King-Mesa Gin general manager Jerry D. Harris was vice president of Lamesa Cotton Growers Association at the time.

Harris says Jesse S. Moore, the now-retired director of the Cotton Division of USDA's Agricultural Marketing Service, was vital to the project. Moore, however, says it was a case of two groups serving each others' needs.

"We knew this was a superior classing system, and we were looking for a community where we could prove it," says Moore.

"Lo and behold—at the same time we were looking—Lamesa growers volunteered."

There were many start-up problems and differences of opinion between cotton industry groups, recalls Harris. "HVI forced us producers to look at our product, at the quality of our fiber. Before HVI, we didn't know what kind of cotton we were growing."



Cotton classing today uses modern High-Volume Instrumentation equipment. Photo courtesy of Zellweger Uster, Inc.

Because growers and breeders could better evaluate their current crops, they were also able to identify cotton with valuable genetic traits.

"Since plant breeders can now gauge quality with better certainty, we've been able to upgrade strength by about 30 percent in Texas," says Carl G. Anderson. He is a cotton marketing specialist with Texas A&M University.

But, adds Harris, HVI classification resulted in improved cotton quality all around the world—not only in Lamesa. Within a few years of the advent of High-Volume Instrumentation, he says, Japanese and other textile mills were asking for Lamesa cotton—and cotton classification—by name. So were domestic mills.

"Before HVI, 90 percent of our cotton was exported at a discount because of its perceived poor quality. Today, 60 percent of it goes to the more profitable domestic market," says Harris.

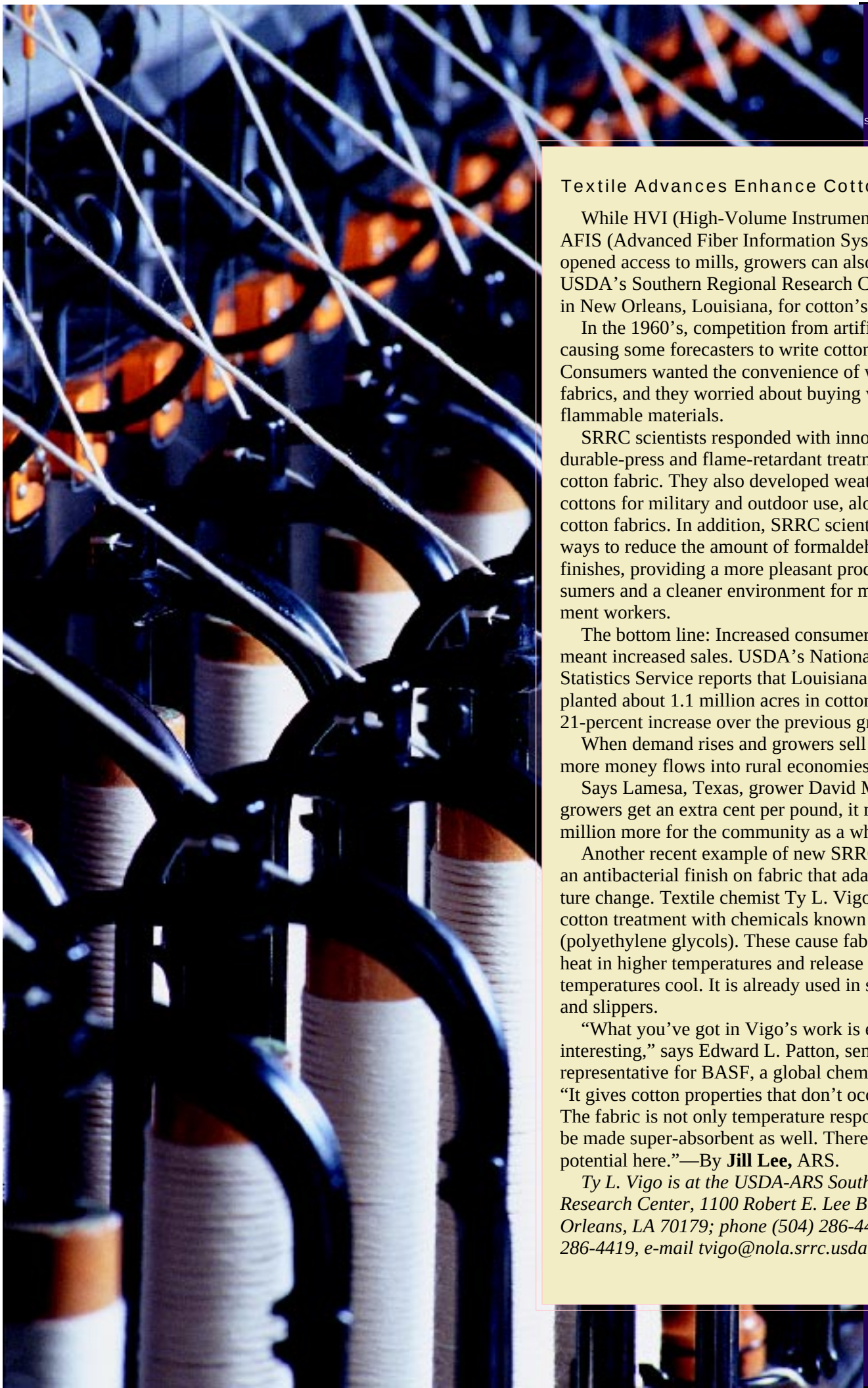
Even so, "It was a real gamble," recalls grower Dave M. Nix, another former president of Lamesa Cotton Growers. He farms 2,400 acres.

"For all we knew, we could have been growing junk cotton. But what we found was that our cotton is as good as products selling for 7 cents more per pound," says Nix.

Having a clear indication of cotton quality is important to mills, because the fabric they make depends on the kind of cotton they buy. Though coarse, short fibers are satisfactory for blue jeans, a flowing summer dress demands more expensive long, fine fibers.

But Lamesa isn't the only community benefiting from this cotton classing technology. Eighteen cotton-producing nations recently agreed to incorporate HVI classification as part of an international quality standard. In fact, HVI data can be transmitted all over the world through computers.

"HVI systems have been installed worldwide," says Harmon H. Ramey, chief of the Fiber Technology Branch with USDA's Agricultural Marketing Service, the agency that classifies all U.S.-grown cotton for domestic and international markets. HVI became a part of the AMS standard grading system in 1991.



SCOTT BAUER (K7278-2)

Textile Advances Enhance Cotton Markets

While HVI (High-Volume Instrumentation) and AFIS (Advanced Fiber Information System) have opened access to mills, growers can also thank USDA's Southern Regional Research Center (SRRC) in New Orleans, Louisiana, for cotton's market.

In the 1960's, competition from artificial fibers was causing some forecasters to write cotton's obituary. Consumers wanted the convenience of wash-and-wear fabrics, and they worried about buying weak or flammable materials.

SRRC scientists responded with innovations such as durable-press and flame-retardant treatments for cotton fabric. They also developed weather-resistant cottons for military and outdoor use, along with stretch cotton fabrics. In addition, SRRC scientists found ways to reduce the amount of formaldehyde in fabric finishes, providing a more pleasant product for consumers and a cleaner environment for mill and garment workers.

The bottom line: Increased consumer demand meant increased sales. USDA's National Agricultural Statistics Service reports that Louisiana growers planted about 1.1 million acres in cotton in 1995—a 21-percent increase over the previous growing season.

When demand rises and growers sell more cotton, more money flows into rural economies.

Says Lamesa, Texas, grower David M. Nix, "If our growers get an extra cent per pound, it means $1 million more for the community as a whole."

Another recent example of new SRRC research is an antibacterial finish on fabric that adapts to temperature change. Textile chemist Ty L. Vigo developed a cotton treatment with chemicals known as PEGS (polyethylene glycols). These cause fabrics to absorb heat in higher temperatures and release it when temperatures cool. It is already used in socks, gloves, and slippers.

"What you've got in Vigo's work is extremely interesting," says Edward L. Patton, senior sales representative for BASF, a global chemical company. "It gives cotton properties that don't occur naturally. The fabric is not only temperature responsive, but can be made super-absorbent as well. There's lots of potential here."—By **Jill Lee,** ARS.

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Painting by Edgar Degas shows cotton classing in New Orleans, Louisiana, in 1873.

While many nations benefit from HVI, the system has helped U.S. growers gain new stature in competitive world markets.

"On average, U.S. cotton enjoys a premium in the world market," says Mark D. Lange, who is chief economist for the National Cotton Council, a group representing the domestic cotton industry. "It's due to many things, including HVI grading and widespread faith in U.S. delivery contracts."

If growers get 4 cents more per pound premium, that can mean an extra $355 million for the industry, based on the 18.5 million bales classed for the 1994-95 crop. About half of the crop (9.5 million bales) was exported.

Cotton Incorporated, a marketing and research group for U.S. cotton growers, developed computer software that manages HVI data. This software provides cotton management and analysis information, as well as electronic communication between mills, ginners, producers, and merchants.

ARS textile technologist Charles K. Bragg heads the Clemson, South Carolina, laboratory where HVI was born. Bragg was just joining the research unit when HVI prototypes were being developed. His goal was to make HVI more consistent, so quality ratings would have worldwide dependability.

"We needed to develop instrument systems so that whether growers were in Memphis, Tennessee, or Memphis, Egypt, their HVI measurements meant the same thing," says Bragg.

Actually, HVI is not one machine, but three—each feeding data into a central computer.

The first machine tests a fiber's resistance to a puff of air, which is determined by its fineness. The second uses a device called a colorimeter to detect subtle variations in cotton color, from gray to yellow to white. It also has a video camera to detect leaves, stems, and other trash. The third machine uses air to draw fibers out to their full length and measure them—and then pulls the fibers apart to test their strength.

"The concept was very simple. Precision measuring equipment for cotton already existed for use in the laboratory. The trick was to consolidate, automate, and speed up the steps so that an integrated system could measure 800 samples in an 8-hour day, instead of 40," Bragg says.

Before the advent of HVI, most cotton testing was done manually. In one test method, fibers were separated by length and laid out on black felt. Then someone would measure the fibers to determine their average length, and a second person would check that measurement. To test strength, the fibers were fastened in clamps by hand and broken in a cumbersome pendulum-type device that operated very slowly.

Now, the latest development in quality measurement is AFIS, Advanced Fiber Information System, which detects fiber fineness, diameter, and length. It can also remove cotton trash and detect immature, undyable fibers called neps.

AFIS was born over a business lunch Bragg shared with William F. Lalor and Frederick M. Shofner, two scientists from the cotton industry. By the end of their lunch, they had a rough blueprint for AFIS drawn on a napkin. That blueprint, scribbled with notes, dated, and signed by the three scientists, is framed on Bragg's office wall.

Today, there are 350 AFIS systems worldwide, says Peter C. Jones, who is with Zellweger Uster of Knoxville, Tennessee, the company that sells both AFIS and HVI machines. "AFIS has only been on the market since the early 90's, but it's really catching on," he says.

According to Bragg, there are about 1,000 of the ARS-developed HVI classification systems in operation worldwide.—By **Jill Lee,** ARS.

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DAVID NANCE

Harvesting cotton in western Texas. (K5925-12)